Midterm Exam

CMSY-199, Fall 2012

Section 1. Answer True or False to each of the following statements:

_____ 1. If the number of loop iterations is known in advance, it is best to use sentinel-controlled repetition.

_____ 2. The Java selection statements include `for`, `do...while`, and `while`.

_____ 3. The `break` and `continue` statements can be used to pause and restart program execution.

_____ 4. The conditional OR operator (`||`) has lower precedence than the conditional AND operator (`&&`).

_____ 5. A `static` method may be called without creating an instance of a class.

_____ 6. Methods which have the same name but different signatures are said to be overloaded.

_____ 7. The number of elements in an `ArrayList` can be returned with a call to its `size()` method while the number of elements in an array is stored in its `length` field.

_____ 8. The statement `int[] intArray = new int[4];` creates an integer array with each element initialized to the value `4`.

_____ 9. The `ArrayList` class can automatically change size at runtime to accomodate additional elements.

_____ 10. The `ArrayList` class is a member of the `java.collections` package.

Section 2. Circle the letter of the best answer for each question:

11. What symbol is used in Java to start an escape sequence?
    (a) underscore
    (b) backslash
    (c) ellipsis
    (d) caret
12. Which identifier follows the standard Java code conventions for naming a class?
    (a) `7wonders`
    (b) `SEVEN_WONDERS`
    (c) `sevenWonders`
    (d) `SevenWonders`

13. Which identifier follows the standard Java code conventions for naming an instance variable?

    (a) `someVariable`

    (b) `SOME_VARIABLE`

    (c) `_someVariable`

    (d) `ivar_someVariable`

14. The command-line arguments for a Java application are stored in an array called `args`. What is stored in the the field `args.length`?

    (a) The first command-line argument

    (b) The number of command-line arguments

    (c) The name of the Java application

    (d) The version number of the JVM

15. Which primitive type in Java is represents a two byte signed integer value?

    (a) boolean

    (b) byte

    (c) char

    (d) short

16. Which of the following Java keywords can be used to gain access to a class from another package?

    (a) `include`

    (b) `import`

    (c) `using`

    (d) `use`

17. Which of the following primtive types cannot be promoted to an `int` in Java?

    (a) `byte`

    (b) `char`

    (c) `double`

    (d) `short`

18. The maximum value that can be represented by the primitive `int` type in Java is

    (a) 127

    (b) $32,767$

    (c) $2,147,483,647$

    (d) $4,294,967,295$

19. Which of the following is an exception thrown by the JVM?

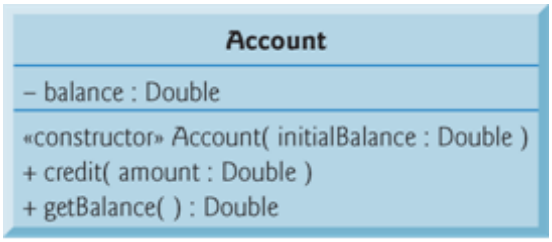
    (a) `ArrayIndexOutOfBoundsException`

    (b) `MissingSemicolonException`

    (c) `OmittedReturnValueException`

    (d) `UnbalancedBracesException`

20. What Java access modifier would be used for the `getBalance()` method in the UML diagram shown below?



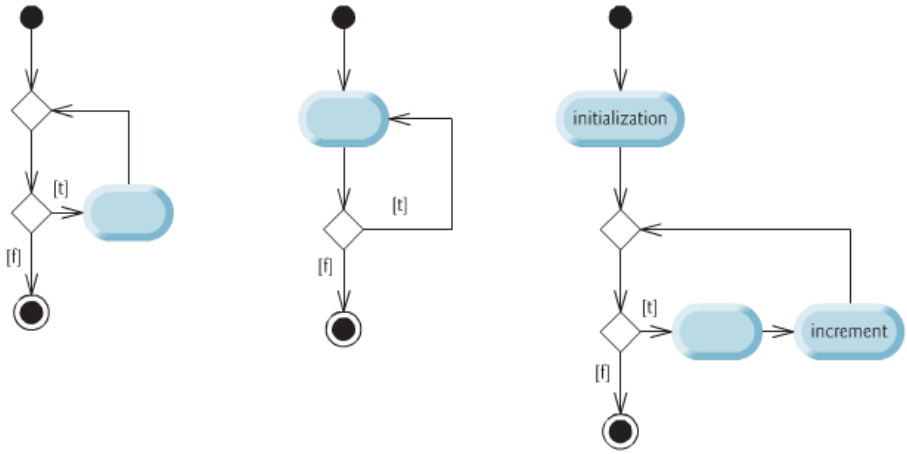
    (a) `public`

    (b) `private`

    (c) `protected`

    (d) no modifier is needed - default or package access

21. Which Java control statement is *not* represented in the set of UML activity diagrams shown below?



    (a) `do...while`

    (b) `for`

    (c) `switch`

    (d) `while`

Section 3. Answer the following questions:

22. Given the following three-argument constructor, write a Java statement to create an instance of the `Employee` class called `oracleChief` for an employee whose name is Larry Ellison and has an annual salary of 84.5 million dollars.

```
public Employee(String first, String last, double pay)
{
   firstName = first;
   lastName = last;
   salary = pay;
}
```

23. The `determineLargest` method takes a ten-element integer array and returns the largest integer in that array. Write the Java code to implement this method.

```
public int determineLargest(int number[])
{









}
```

24. Using the static `min` method from the `Math` class, write a single Java statement which assigns the smallest of three integer variables - `a`, `b`, and `c` - to an integer variable named `minimum`.

25. What output is produced by the following Java code segment?

```
for (int i=1; i <= 4; i++)
{
   for (int j=1; j <= i; j++)
      System.out.print("*");
   System.out.println();
}
```

26. Complete the `TrafficLight` class by writing a `switch` statement that prints the appropriate action to take based on the color of the traffic light.

```
public class TrafficLight
{
   private enum Color {RED, YELLOW, GREEN};

   public void printAction(Color lightColor)
   {
      switch(                    )
      {









      }



   }


}
```

Section 4. Circle the letter of the best answer for each question:

27. What is the output when the following Java application is run?

```
public class Dog
{
   private String name;

   public static void main(String args[])
   {
      Dog myDog = new Dog();
      myDog.name = "Achilles";
      int age = 6;

      changeDog(myDog, age);
      System.out.println(myDog.name + "  " + age);
   }

   private static void changeDog(Dog dog, int age)
   {
      dog.name = "Chloe";
      age = 5;
   }
}
```

(a) `Achilles 5`

(b) `Achilles 6`

(c) `Chloe 5`

(d) `Chloe 6`

28. What is the output if you compile and execute the following Java application?

```
public class Hello
{
   public static void main(String args[])
   {
      System.out.println("Hello");
   }
}
```

(a) `"Hello"`

(b) `Hello`

(c) Compilation fails.

(d) An exception is thrown at runtime.

29. Consider the following code segment.

```
public class Break
{
   public static void main(String args[])
   {
      int k = 4;
      while (true)
      {
         k--;
         int j = 6;
         k = 13 - j;
         if (j-- == 3)
            continue;
         else
            break;
      }
      System.out.println(--k);
   }
}
```

What is printed as a result of executing the code segment?

(a) 2

(b) 3

(c) 6

(d) 7

30. What is the output if you compile and run the following Java application with the command `java Vark we rule`?

```
public class Vark
{
   public static void main(String args[])
   {
      Vark v = new Vark();
      v.go(args,42);
   }

   private void go(String a[], int life)
   {
      System.out.println(a[2]);

   }
}
```

(a) `we`

(b) `rule`

(c) Compilation fails.

(d) An exception is thrown at runtime.

31. What is the output if you compile and run the following Java application?

```
public class ForLoop
{
   public static void main(String args[])
   {
      int x = 2;
      int y;
      for (y=2; y > 0; y--)
      {
         System.out.print(x + " " + y + " ");
         x++;
      }
      System.out.print(x + " " + y + " ");
   }
}
```

(a) `2 1 3 0`

(b) `2 2 3 1 4 0`

(c) Compilation fails.

(d) An exception is thrown at runtime.

32. Consider the following code segment.

```
for (int k = 0; k < 20; k = k + 2)
{
   if (k % 3 == 1)
   System.out.print(k + " ");
}
```

What is printed as a result of executing the code segment?

(a) `4 16`

(b) `4 10 16`

(c) `0 6 12 18`

(d) `1 4 7 10 13 16 19`

(e) `0 2 4 6 8 10 12 14 16 18`

33. Consider the following code segment.

```
ArrayList<String> list = new ArrayList<String>();

list.add("P");
list.add("Q");
list.add("R");
list.set(2, "s");
list.add(2, "T");
list.add("u");
System.out.println(list);
```

What is printed as a result of executing the code segment?

(a) `[P, Q, R, s, T]`

(b) `[P, Q, s, T, u]`

(c) `[P, Q, T, s, u]`

(d) `[P, T, Q, s, u]`

(e) `[P, T, s, R, u]`

Section 5. Fill in the blanks in each of the following statements:

34. There are two aspects to learning Java - the _____ itself and the classes in the _____.

35. In order to read keyboard input from the user in a Java program, you should import the _____ class from the _____ package.

36. A compilation error which violates the rules of the Java language is a _____ error while a runtime error that produces an incorrect result is a _____ error.

37. In order to create an instance of a class, you must use the _____ keyword and make a call to the _____.

38. Java has two fundamental data types - the _____ type and the _____ type.

39. The members of a class consist of its _____ and _____.

40. When writing a GUI application, you often need to import classes from the java._____ and the javax._____ packages.